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LETTER AND RESPONSE TO REGULATOR COMMENTS ON DRAFT TIER II SAMPLING
AND ANALYSIS PLAN SITE 34 DATA GAP INVESTIGATION NWS YORKTOWN VA

10/08/2013
CH2M HILL



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October 8, 2013

Mr. Moshood Oduwole
Federal Facility Remediation (3HS11)
USEPA Region 3
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Subject: Response to Comments *Draft Tier II Sampling and Analysis Plan for Site 34 – Data Gap Investigation, WPNSTA Yorktown, Yorktown, Virginia*

Dear Mr. Oduwole,

This letter is in response to comments on the subject document provided in your letter dated September 4, 2013 and the email received on September 9, 2013. The EPA comments are shown followed by the Navy responses in italics.

USEPA Biological Technical Assistance Group (BTAG) Comments

The proposed sample locations in the September 9, 2013 e-mail are understood to replace the proposed locations included in the September 4, 2013 letter. Therefore, only the e-mail comment is listed below.

Comment: Unless otherwise indicated, the numbered items below refer to sediment sample locations and Figure 8 for the Site 34 SAP at NWS Yorktown. All of these sediment sample locations will need to be field identified. The recommended sediment sample locations are:

1. Sample original location YSA14-SD04;
2. Sample half way between YSA14-SD04 and the nearest removal action boundary;
3. Sample two more locations on the 25 and 50 foot radius lines south of the location described in 2 above;
4. In the drainage feature east of YSA14-SD04 spread four samples along this drainage, approximately at the head end (this may be a bifurcated head), east of YSA14-SD04, at the head end of the open water, and at the discharge point to Felgates Creek;
5. A Google Earth Pro map of Site 34 suggests another drainage exists east of the drainage described in 4 above. Two to three sediment samples need to be included in this drainage at the head end and discharge point as well as in between these two;
6. Finally, if there are any other drainages off the slope into this wetland, other than those identified here, they also need to be sampled.

Response: The proposed sediment sample locations will be modified as suggested in Items 1 through 4 above (at previous sample location YSA14-SD04 and along two north-south drainage lines, located to the west and east of the YSA14-SD04). Upon review of the Storm Water Pollution Prevention Plan for Yorktown, the sample locations described in Item 5 are located within a drainage area outside of the influence of Building 537 and the drainage pipe. Since these samples locations are influenced by runoff coming from areas to the northeast of Site 34, they would not provide information reflective of any potential contaminant releases from Site 34 to wetland sediment. Therefore, this area will not be included in the data gap investigation. As a result of these recommendations, 7 sediment samples are proposed to be collected as part of the data gap investigation (see attached **Figure 8**). Of note, no samples will be held for analysis pending (that is, there will be no secondary samples).

Sediment samples will be analyzed for site-related constituents of potential concern (COPCs) that may have impacted sediment in the wetland area, outside of the removal action footprint. For this data gap investigation, COPCs include 1) any constituents of concern (COCs) identified during the Round Two RI risk assessments (Baker, 2004) in sediment or soil which may currently pose unacceptable risks to sediment receptors and 2) any soil COPCs identified during the soil sampling portion of this data gap investigation. In regards to the first item, mercury is the only COC which was identified during the 2004 risk assessments which is considered to potentially pose a current risk to sediment receptors, as the 2007 removal action removed the sediment located directly downgradient of Building 537 and the discharge pipe. Although BEHP, HMX, iron, vanadium, selenium, and zinc were also identified as soil or sediment COCs, concentrations of these constituents were all below screening values in sediment samples collected outside of the removal action footprint (see table below). Although total chromium concentrations did exceed the human health risk-based value for hexavalent chromium, they were below the ecological screening value. Given the site history, it is highly unlikely that hexavalent chromium was released at the site, and therefore, total chromium is most likely composed of trivalent chromium. In addition, both the 2004 and 2011 human health risk evaluations concluded that chromium did not pose unacceptable risks to human health from sediment. In regards to the second item, soil COPCs will be identified after the soil investigation of Building 537 and its associated piping has been completed.

Parameter	Sediment Ecological Screening Value	Human Health Screening Value (Adjusted RSL)	YSA14-SD04 (12/14/07)	YSA14-SD06 (12/14/07)	YSA14-SD07 (6/21/05)	YSA14-SD10 (6/21/05)
Semivolatiles ($\mu\text{g}/\text{kg}$)						
bis(2-Ethylhexyl)phthalate (BEHP)	182	350	Non-Detect	Non-Detect	Non-Detect	Non-Detect
Explosives ($\mu\text{g}/\text{kg}$)						
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	115,000	3,800	Non-Detect	Non-Detect	Non-Detect	Non-Detect
Total Metals (mg/kg)						
Chromium	81	2.9 - Cr(IV)	39.8	34.5	Not Analyzed	Not Analyzed
Iron	220,000	55,000	35,900	36,500	Not Analyzed	Not Analyzed
Mercury	0.15	0.78	1.2	0.091 L	0.098 J	0.11 J
Selenium	1	390	Non-Detect	Non-Detect	Non-Detect	Non-Detect
Vanadium	57	390	57	41.5	Not Analyzed	Not Analyzed
Zinc	150	23,000	118	101	123	135

As a result of these changes, the following objective in the Executive Summary and in Section 4.1.1 of the SAP,

"Further define the extent of mercury potentially present in sediment in the vicinity of a groundwater RI sediment sample located in the wetland area near the edge of a previous removal action to determine if addition remedial action is warranted"

will be revised as follows:

"Determine if historical activities at Building 537 and its associated piping have impacted sediment within the wetland area and located outside of the removal action footprint, in a manner that would warrant additional remedial action"

In Section 6 of the SAP, the sampling rationale for the sediment samples will be revised as follows:

"Sediment Samples: Seven sediment samples will be collected in order to determine if sediment outside of the removal action footprint have been impacted by historical industrial activities at Site 34. All sediment samples will be surface samples, collected from 0 to 4 inches bgs. One sediment sample will be collected from the historical sample location YSA14-SD04. Six sediment samples will be collected along two drainages, located to the west and east of this historical sample, as shown on **Figure 8**. Outside of the removal action footprint, these two drainages are considered to be the most likely pathway for runoff, or overland flow, from Building 537 and its associated piping into the wetland area. Final locations will be determined in the field and sediment will be preferentially collected from topographically low areas that exhibit deposition within the wetland; this will only include locations less than an approximate 3-foot elevation (local tidal range).

Sediment samples will be collected after the soil sampling and analysis portion of this data gap investigation has been completed. This information will be used to determine the final analyte list for the sediment samples. At a minimum, all sediment samples will be analyzed for mercury to determine if concentrations have changed following the 2007 removal action and assess current risks. Currently, mercury is considered to be the only COC that was identified in previous human health and ecological risk evaluations (Baker, 2004; CH2M HILL 2011) that may be posing unacceptable risks in sediment. Sediment samples will be analyzed for mercury using the SW-846 7471A/7470A method, which will provide quantifiable results below the PALs. To confirm that there have been no other impacts to wetland sediment outside of the removal action footprint, sediment samples will also be analyzed for any constituents identified as posing a potential risk during the soil portion of this data gap investigation. If needed, samples will be analyzed using the methods listed in the Table 7-2."

Analytical data will be evaluated against the PALs and site-specific background concentrations (maximum value from six site-specific background samples collected in the upper portion of Felgates Creek as part of the groundwater RI [CH2M HILL, 2011]). If there are exceedances of the PALs, the Yorktown Partnering Team will determine the significance of the magnitude and areal extent of exceedances in the samples, and if additional action is necessary. If there are no exceedances of the PALs, then no further action will be needed.

A new project planning session discussion will be added to Section 3 of the UFP-SAP to summarize the changes to the SAP based on the BTAG comments. The remainder of the SAP will also be updated

accordingly to reflect changes in the sampling objectives, rationale, number, and location of sediment samples.

USEPA Hydrogeologist Comment

Comment: Section 3.2.6 Data Gaps Identified for Site 34 -Page 27: It is stated here that although there are no monitoring wells installed directly at the base of the Yorktown-Eastover aquifer. This is not identified as a data gap for several reasons. The MIP investigation results showed high ECD response (indicative of CVOC contamination) above the silt and clay lens with very low ECD readings directly below the clay lens. Therefore the clay lens appears to be acting as a semi-confining layer and restricting downward vertical migration of CVOC contamination. However;

- i. Although the Membrane Interface Probe (MIP) is a great screening tool to delineate soil and groundwater contaminated with VOCs, it has its limitations. According to a scientific paper regarding the application of the MIP published by The American Academy of Environmental Engineers in 2007, PCE and TCE must be present at concentrations greater than or equal to approximately 200 micrograms per liter ($\mu\text{g}/\text{L}$) in groundwater to be detected by the MIP ECD. Also, because the concentrations range for detecting VOCs using the ECD overlaps with those for the PID and FID, it is possible to evaluate both source areas and plumes at most chlorinated solvent sites using the MIP and multiple detectors. **However, it is not possible to detect most compounds at concentrations corresponding to their Federal Drinking Water Standards.** Ravella Michael, R.J. Fiacco, Frazier Jeffrey, Wanty Duane, and Burkhardt Louis (2007) Application of the Membrane Interface Probe (MIP) to Delineate Subsurface DNAPL Contamination, Environmental Engineer: Applied Research and Practice Volume 1, Winter 2007, published by American Academy of Environmental Engineers; Annapolis, Maryland.
- ii. Based on the facts that there are no monitoring wells installed directly at the base of the Yorktown-Eastover aquifer and only low ECD readings directly below the clay lens was used to determine that CVOC were not detected at depth, the vertical delineation is not completed. Groundwater samples should be taken at the bottom of the Yorktown-Eastover aquifer to confirm or refute the MIP results.
- iii. The new proposed monitoring wells should be able to confirm the presence, thickness and continuity of the clay lens encountered within the Yorktown-Eastover aquifer and groundwater samples should be taken directly above the clay lens. Because the clay lens is the basis for this Conceptual Site Model, it must be clearly defined in the report.

It is stated here that even if CVOCs are present in groundwater at the bottom of the aquifer, this zone would not be included in a treatment scenario because concentration most likely be very low and most technologies would breach the clay lens that is currently restricting vertical migration. For these reason, the vertical extent of the dissolved plume is considered to be adequately defined to complete a groundwater feasibility study for the site. However, one of the Remedial Action Objectives is to restore the aquifer to its beneficial use, hence any contaminant level above the drinking water standards must be included in any treatment scenario. Regarding the breach in the clay lens, Figure 7 shows that the screen of the well AGW05A go through the clay, which is already a breach in the clay lens as well as a contaminant preferential pathway.

It is stated here that Deep monitoring well A14GW01A shows that the dissolved CVOC plume has not migrated into the Eastover-Calvert confining unit, however this well was installed in the low permeability unit instead of at the base of the Yorktown-Eastover aquifer, when the MIP results shows neither residual DNAPL nor very high CVOC concentrations. The purpose of well A14GW01A is not clear.

Response: *An additional new monitoring well (Y34GW09A) will be installed adjacent to newly proposed YS034GW09 and screened at the base of the Yorktown-Eastover aquifer to confirm whether the contaminant plume extends to the bottom of the aquifer (see revised Figure 5). This proposed well is located in between the two monitoring wells with the highest concentrations (A14GW01 and A14GW05) and approximately 30 feet downgradient of deeper monitoring wells (AGW01A and AGW05A), which should provide additional vertical and horizontal characterization of the plume. Note that monitoring well A14GW01A was installed prior to the groundwater RI to help assess if contamination could have potentially migrated to the deeper aquifer. While the MIP electrical conductivity data provided good confirmation that the clay lense was present beneath the majority of the plume, additional lithologic data will be collected during the data gap investigation to further confirm the continuity and thickness of the clay lense. Continuous soil samples will be collected at the new deep well Y34GW09A and at the newly proposed upgradient well (YS34GW07) to the Eastover-Calvert confining unit for lithologic logging (see revised Figure 6). Additionally, continuous soil samples will also be collected at newly proposed wells YS34GW06 and YS34GW08 to the top of the clay lense (see revised Figure 7). The borings will not advance through the clay lense at these locations in order to prevent further damage to the clay lense, particularly near the plume. The text, tables, and figures in the UFP-SAP will be updated to clarify the depth of the lithologic logging at each soil boring and to add a new deep well for installation, sampling, and groundwater analysis of select VOCs and natural attenuation indicator parameters.*

USEPA Toxicologist Comment

Comment: Section 3.2.5 (page 25): The second bullet discusses potential exposure pathways under a future residential scenario. In addition to the pathways listed, inhalation of vapors while showering should be included.

Response: *The bullet will be updated to read, "Potential future resident (adult and child): incidental ingestion of and dermal contact with surface and subsurface soil, inhalation of particulate and volatile emissions from surface and subsurface soil, ingestion and dermal contact with groundwater, inhalation of volatiles in indoor air from vapor intrusion while showering, and inhalation of volatiles in indoor air from vapor intrusion from shallow groundwater". The CSM will also be updated to reflect this change.*

Mr. Moshood Oduwole

October 8, 2013

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Please provide acceptance of these responses. Any back comments are requested by October 22, 2013. Should you have any additional questions, please feel free to contact me.

Sincerely,

CH2M HILL

A handwritten signature in black ink that reads "William J. Friedmann Jr."

William J. Friedmann, Jr.

Activity Manager

cc: Mr. Wade Smith/VDEQ
Mr. James Gravette/NAVFAC Midlant
Ms. Mary Anderson/CH2M HILL
Ms. Kristin Brickman/CH2M HILL